

What is claimed is:

1. A method of the gasification of coal using oxygen and steam, wherein the coal is gasified at a temperature of from 1000 to 2500 °C and a pressure of from 1 to 100 kg/cm² using oxygen generated by electrolyzing water and steam heated to a temperature of from 300 to 600°C through a heat exchange with high-temperature gas from the coal gasifier.
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2. The method according to claim 1, wherein hydrogen generated by the water electrolysis is mixed with the gas generated by the gasification whereby a gas mixture is produced.
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3. The method according to claim 1 or 2, wherein oxygen is introduced in an amount of 0.3 to 1.1 times as much as a required molar amount of oxygen calculated by subtracting a molar amount of oxygen in the feed coal from a half of the molar amount of carbon in the feed coal.
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4. The method according to any one of claims 1 to 3, wherein the steam is introduced in an amount of 0.15 to 0.6 time as much as a weight of the coal used in the gasification.
5. The method according to any one of claims 1 to 4, wherein the gasification is performed at a pressure of from 15 to 80 kg/cm².
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6. The method according to any one of claims 1 to 5, wherein pulverized coal is supplied to gasification reactor by a pneumatic transportation method using carbon dioxide, nitrogen, or hydrogen, or by a water slurry method.
- 25 7. A method of the gasification of coal using steam, wherein the coal is gasified at a temperature of from 1000 to 2500 °C and a pressure of from 1 to 100 kg/cm² using steam having a temperature of from 2,000 to 2,700 °C, which steam is prepared by reacting hydrogen with oxygen, both hydrogen and oxygen being generated by electrolyzing water.
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8. The method according to claim 7, wherein oxygen is introduced in an amount of 1 to 1.5 times as much as a required molar amount of oxygen calculated by subtracting a molar amount of oxygen in the feed coal from a half of the molar amount of carbon in the feed coal.
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9. The method according to claim 7 or 8, wherein hydrogen is introduced in an amount of from 2 to 3 times as much as a required molar amount of oxygen calculated by subtracting a molar amount of oxygen in the feed coal from a half of the molar amount of carbon
10 in the feed coal.
10. The method according to any one of claims 7 to 9, wherein the temperature of steam is in the range of from 2000 to 2700 °C.
11. The method according to any one of claims 1 to 10, wherein the electrolysis of water is carried out using an electric power
15 generated by wind power, waterpower, or the solar energy.
12. The method according to claim 11, wherein at least a sufficient amount of oxygen or at least sufficient amounts of oxygen and hydrogen for the 24 hours operation of coal gasification is produced in the electrolysis of water.